SISSA – International School for Advanced Studies Journal of Science Communication
ISSN 1824 – 2049 http://jcom.sissa.it/

Comment

Scientific education and European citizenship. Suggestions and results from the European project SEDEC

Roberto Ceriani

Two concepts seemingly distant from each other, scientific education and European citizenship, have been the basis for "SEDEC - *Science Education for the Development of European Citizenship*", a European project funded by the European Commission in the framework of the Socrates/Comenius programme, aiming at producing training material addressed to European teachers. Started in autumn 2005, the project will end in 2008 with an in-service training course for European teachers and educators.[1]

What do Science and Citizenship have in common? How can scientific education and citizenship education reinforce each other? The history of science and the scientific method reveal that, in the process of shaping a scientific knowledge, nobody is a repository of *a priori* truths - to validate a hypothesis for research, it must be subjected to complex verification procedures before being accepted by the scientific community as a "good provisional truth".

This integrated process of hypothesis, experiment and verification, forces the scientific community members, even in their frequent conflicts, to accept one another, since nobody really knows who will be right or wrong. Even if verification places the right on somebody else's side, it is not always a final verdict and the work of those proved wrong is hardly wasted, as it may be used to spur new research projects and build other "temporary truths".

In a civil society of normal coexistence, the rules regulating relationships and citizenship differ from the ones of the scientific community - everyday life sees either enduring conflicts or conflicts settled for reasons other than experimental verification. Even though the rules for the relations among citizens can be hardly reduced to those of the scientific community, it is possible to hypothesise that, should all citizens behave as researchers do within their working environment, the result would probably be a smaller number of conflicts based on ideological prejudices and an easier dialogue between contrasting stances.

Consequently, albeit keeping these two fields clearly separate from each other, it is rightful to think that a good scientific education provided at school may be helpful to develop a sense of citizenship in students. A student used to applying the scientific method, formulating hypotheses for research, verifying them with methodological rigour, making experiments, comparing his/her hypotheses with the ones of fellow researchers, etc., will be "obliged" to consider every statement, either by him/her or by other people, as a possible truth to be subjected to verification, to respect other students' ideas, to change his/her mind when a better solution is found by somebody else.

This student, thanks to the scientific education received, is implicitly trained for a citizenship relation based on mutual respect, on a cooperative research for truth, on the defence of the validity or not of a statement by reason of comparison with facts, i.e. with the subject of the statement, rather than a prejudice related to its promoter. In other words, it will be easier to develop a sense of belonging to a civil community in a student accustomed to using the scientific method correctly, rather than in a student incapable of distinguishing the ideological level from the confrontation on factual data.

Furthermore, it is to be considered that many choices the contemporary society, even in Europe, is called upon to make, regard issues that involve scientific and technological knowledge (e.g. energy, transport, the protection of the environment and of health, etc.). Learning to discuss and to make decisions on these issues, in the framework of an in-depth and open dialogue among non-expert citizens, authorities, scientists and researchers is a heritage we deem fundamental for the European citizens. It

implies the ability to handle issues such as the cost/benefits relation, risk management and communication, the evaluation of the scientific evidence for drug effectiveness, and the likes.

The SEDEC project is therefore based on the hypothesis that a good scientific education is necessary to development and progress, and prepares the students to a constructive citizenship relation with his/her fellows, taking scientific education as a catalyst for positive relations among people.

Translated by Massimo Caregnato

Notes and references

[1] Project partners are: ANSAS (ex IRRE) Lombardia, Italy (coordinator); Museo Nazionale della Scienza e della Tecnologia Leonardo da Vinci, Milano, Italy; Sissa Medialab, Trieste, Italy; Centro de Formação Dr. Rui Grácio, Lagos, Portugal; I.U.F.M. de Lorraine, Maxéville, France; Olsztynskie Planetarium i Obserwatorium Astronomiczne, Olsztyn, Poland; University of Ostrava, Faculty of Science, Ostrava, Czech Republic; Institute for Educational Sciences, Bucharest, Romania.

Author

Graduated in physics, for years Cerini has taught "*Mathematics and Physics*" at scientific high schools in Milan. A trainer for teachers from the *Piano Nazionale per l'Informatica* (Information technology National Plan), he has held several training courses for science teachers in service. As a researcher at IRRE Lombardia (*Istituto Regionale di Ricerca Educativa* – Regional Institute for Educational Research), he has published books and articles addressed to teachers, coordinated projects on the didactic use of the information technologies and participated in various European projects in the scientific area. After having supervised the SEDEC European project (http://old.irrelombardia.it/sedec/ http://albert.osu.cz/oukip/knybel/comenius/), he now works as a headmaster. E-mail: ceriani@irre.lombardia.it.